DOCUMENT RESUME

ED 191 860 TM 800 466

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TITLE A Simple Procedure for Analyzing Task Appropriateness, with Applications in Remedial Reading Instruction.
PUB DATE Apr 80
NOTE 29p.: Paper presented at the Annual Meeting of the American Educational Research Association (64th, Boston, MA, April 7-11, 1980).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Affective Behavior: Cognitive Processes: Educational Diagnosis: Elementary Education: Grade 2: Grade 5: *Reading Achievement: *Remedial Reading: *Success: *Task Analysis: Teaching Methods: Time Factors (Learning)
IDENTIFIERS *Academic Learning Time

ABSTRACT

Research is reviewed on high success (low error rate) during instructional tasks in relationship to learning outcomes: alternative interpretations of the relationship are considered: and alternative strategies for controlling success during remedial reading instructional tasks are discussed. A simple procedure is described for the analysis of error rates occurring during remedial reading instruction which may be used as an indicator of the appropriateness of the task. The procedure is adapted from the Academic Learning Time (ALT) model of the Beginning Teacher Evaluation Study. Three categories of success level are coded: (1) high, when the student is able to complete the task with no errors: (2) medium, when the student is able to perform some of the task correctly: (3) low, when the student is unable to complete any of the task correctly, except by guessing. The teacher of remedial reading should make instructional changes whenever more than half of a student's tasks are coded at medium and low success levels, or when more than ten percent of the tasks are in the low category. (RL)

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# A SIMPLE PROCEDURE FOR ANALYZING TASK APPROPRIATENESS, WITH APPLICATIONS IN REMEDIAL READING INSTRUCTION

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Paper presented at the Annual Meeting

of the American Educational Research Association

Boston, Massachusetts, 1980

TM 800466

## ABSTRACT

The Academic Learning Time (ALT) model of ongoing student learning behaviors (Beginning Teacher Evaluation Study, Fisher et al., 1978) conceptualizes learning events in terms of three basic variables: 1) task relevance to criterion or outcome, 2) student involvement in or attention to the task, and 3) the appropriateness of the task for the student as represented by the student's level of success on that task. This paper considers the third of third of these variables, student success level, as a diagnostic tool for judging task appropriateness, with particular relevance to remedial reading instruction.

"High success" refers, here, to instructional task performance at a high level of accuracy, with no errors or only careless errors. The use of high success as an indication of task appropriateness for remedial reading instruction requires considerable practice and review throughout the instructional program. One could conceptualize this approach as one where mastery of a skill requires automaticity, as well as accuracy, in the performance of that skill. Hence, substantial practice and review would be required for mastery, even after high levels of accuracy had been attained.

Data will be presented to show that second and fifth grade students learn basic reading skills more rapidly if they spend the majority of their instructional time working on tasks that they are already able to perform a high level of accuracy ("high success"). In addition, data will be presented to indicate the possibility that this relationship interacts with reading skill level, such that more proficient readers do not benefit from this concentration of high success activities.

The relationship of high success during instruction and reading achievement is discussed in terms of both cognitive and affective processes. The control of success levels during instruction is considered in terms of both alternative instructional methods and changes in the level within a curriculum at which a student is placed. Finally, a procedure for diagnosing instructional task success levels, with classroom applications, is described.

## Introduction

A considerable and growing body of research covering at least the last three decades (Block, 1971; Bloom, 1976; Fisher et al., 1978a; Skinner, 1954, 1968) indicates that high success (or low error rate) during instructional tasks is crucial to the efficient acquisition of basic skills. It follows that high success should be important to remedial reading instruction insofar as this is one of the "more basic" of the basic skills domains. More recently, specific remedial reading strategies have incorporated high success as an essential component of the instructional task (e.g., Samuels, 1979).

This paper presents a brief review of research on high success (low error rate) during instructional tasks in relationship to learning outcomes, with a discussion of alternative interpretations of the relationship. In addition, alternative strategies for controlling success during remedial reading instructional tasks are considered. Finally, a simple procedure, adapted from previous research (Fisher et al, 1978) is described for the analysis of error rates during instructional tasks as an indication of appropriateness for remedial reading instruction.

## The Concept of High Success

The concept of high success in this paper is taken from the Academic Learning Time (ALT) model of the Beginning Teacher Evaluation Study (Fisher et al, 1978a). The ALT model describes ongoing student learning behaviors in terms of three basic variables: 1) task relevance to criterion or outcome, 2) student involvement in or attention to the task, and 3) the appropriateness of the task for the student as represented by the student's level of success on that task. This paper considers the third of these variables, student success level, as a representation of task appropriateness with particular relevance to remedial reading instruction.

High success in the ALT model represents student performance of an instructional task with no errors other than careless errors. In other words, the student either commits no errors or only errors that s/he would probably not repeat if given a second trial. Thus, the student has mastered the content, at least in terms of producing a correct response. However, this does not mean that the student can perform the instructional task without considerable effort. The ALT model classifies a student task-performance as high success even when the student performs the task slowly, with great concentration and effort, so long as the student responds correctly (excepting "careless" errors). Clearly, high success instructional performance in this model does not require automaticity. Of course, automaticity is not excluded from high success. The student may perform the task quickly and even effortlessly, but this is not required in the ALT concept of high success.

It is important to distinguish the success levels of instructional tasks from the pacing of instruction. Instruction involving great proportions of high success tasks might proceed at a slow or a rapid pacing. Increasingly rapid paces through a given set of instructional tasks may contribute to a reduced success level of student performance on individual tasks, if students commit more errors while trying to keep up the pace. However it is also possible that tasks designed for high student success would result in more rapid pacing if students were thereby able to complete each task more quickly. Brophy (1979) and Harris (1979) make the distinction between success on instructional tasks (or task difficulty) and the pacing of instruction through a sequence of tasks, where high success may coincide with rapid pacing. Further, Becker (1977, p. 524) points out that "Children enjoy the rapid pacing when circumstances allow them to be successful (using the Oregon Direct Instruction Model).

Relationship of Success to Reading Achievement

The Beginning Teacher Evaluation Study research (Fisher et al., 1978) involved a field study conducted in 25 second grade classes and 22 fifth grade classes in several school districts, representing a range of socioeconomic groups in a large metropolitan area. Data were collected for six target students in each class over a five week period from October to December (A-B period) and a sixteen week period from January to May (B-C period). Achievement tests were administered before and after each period. Teachers kept daily records of allocated time throughout each period. Observers collected data on student engagement and success level (as well as verification data on allocated time) one day each week throughout each period.

The success data were collected in three categories: high, medium, and low. High success was coded when students exhibited no errors or only careless errors during an instructional task. Low success represented no correct student response to a task, or only the proportion of correct responses that one would expect by chance. Medium success covered the broad range of response accuracy between the high and low success categories. As one would expect, the low success category occurred for only a very small proportion of reading instruction time, averaging only two percent at grade 2 and one percent at grade 5. Nevertheless, low success was an important negative predictor of student learning in reading. High and medium success each accounted for about half of the remaining instructional time in reading (50 and 48 percent for high and medium respectively at grade 2; 46 and 53 percent for high and medium respectively at grade 5). Therefore, these two categories were essentially ipsative (statistically redundant), so that it was appropriate to analyze only one of the two categories. The positive effects found for high success indicate that the effects of medium success were negative (in relation to learning outcomes in reading).

A summary of the relationships of the ALT variables, including allocated time and engagement rate as well as high and low success, is presented in Table 1. A total of 19 regressions are summarized, where post-achievement scores were regressed on pre-achievement scores and the four ALT variables. Regressions were run for sub-categories of reading achievement and total reading achievement in grades 2 and 5 and the two periods within each grade. Table 1 indicates the number of significant effects ($p \leq .10$) for each ALT variable, the average residual variance accounted for by all four ALT variables combined and the unique proportion of residual variance accounted for by each ALT variable separately. (Note that the sum of the separate unique proportions is less than the combined proportion. This is due to the fact that variance accounted for by two or more ALT variables mutually is excluded from the unique proportions).

Two aspects of Table 1 should be noted. First, all of the significant effects for the ALT variables are consistent in sign. That is, the significant effects of allocated time, engagement rate and high success are always positive. Those for low success are always negative. Second, high success is at least equal to allocated time and engagement rate as a predictor of student learning outcomes. There are more significant effects for high success than for either allocated time or engagement rate at both grades 2 and 5. In addition, high success accounts for more residual variance in achievement, on the average, than either allocated time or engagement rate. There are no significant effects for high success only during the B-C period at grade 5. However, the counterpart to high success, low success, has significant negative effects in three out of the four regressions run for the grade 5 B-C period, whereas allocated time and engagement rate are significant only in one regression each.

Table 1

Summary of Regressions

Combined Effects of ALT Variables

Regression of Post Achievement on Pre Achievement in Reading, Allocated Time, Engagement Rate, High Success and Low Success.

| Grade | Period | Total Number of Regressions | Number of significant effects ($p \leq .10$) positive + or negative - | | | | Average Residual Variance, Combined ALT Variables[a] |
|---|---|---|---|---|---|---|---|
| | | | Allocated Time | Engagement Rate | High Success | Low Success | |
| 2 (N=127) | A-B Period (Oct. to Dec.) | 4 | 2+ | 3+ | 2+ | 0 | .07 |
| 2 (N=139) | B-C Period (Jan. to May) | 7 | 3+ | 2+ | 5+ | 2- | .12 |
| 5 (N=122) | A-B Period (Oct. to Dec.) | 4 | 0 | 1+ | 3+ | 0 | .03 |
| 5 (N=122) | B-C Period (Jan. to May) | 4 | 1+ | 1+ | 0 | 3- | .13 |
| Unique proportion of Residual Variance[b], Average of both grades, both periods, and all 19 regressions | | | .016 | .013 | .019 | .009 | .09 |

[a] "Residual variance" refers to the variance remaining in the Post Achievement measure after Pre Achievement is "removed." This column reports the proportion of this residual variance that is accounted for by the set of ALT variables.

[b] This is the proportion of residual variance accounted for uniquely by the independent variable specified, averaged over all 19 regressions for grades 2 and 5 in the A-B and B-C periods.

These results indicate that student success during instructional tasks is an ongoing learning behavior of equal or greater importance to that of time allocated to criterion relevant tasks or student attention during those tasks. In addition, projective analyses indicate that the practical effects of high student success while engaged in criterion relevant tasks can be of considerable importance. This is illustrated in Table 2, using examples from analysis of grade 2 reading instruction. This table displays total reading scores in October, student engaged time with a high success rate in reading over the period from October to December, and estimated total reading scores in December. The reading scores in December are estimated from linear regressions that use the actual test scores in October and December and the intervening engaged high success time. The regression estimates the most likely December test score for a given combination of an October test score and intervening engaged high success. Total reading scores in October and December are shown both in terms of raw scores out of 100 items (percent of items correct) and in terms of percentile rank among students in the study. Student engaged time with a high success rate in reading (ALT) is shown both in terms of total time over the five week inter-test period and in terms of the corresponding average daily time (in minutes).

Table 2 shows that substantial increases in engaged high success time are associated with important increases in achievement. Consider the student who started the period with a grade 2 reading score that was average (50th percentile, see the top three rows). If this student experiences the average amount of success time (573 minutes total, or 23 minutes per day in reading), then the student can be expected to show average reading achievement in December (50th percentile again). Note also that the "average" student with "average" engaged success time does show considerable learning in terms of predicted raw scores, increasing from 36 to 43 items out of 100 in five weeks.

Table 2

Student Success and Achievement

Examples from Grade 2 Reading Based on the
Beginning Teacher Evaluation Study Results (October to December)

| Reading Score in October | | Student Engaged Time in Reading with High Success Rate | | Estimated Reading Score in December | |
|---|---|---|---|---|---|
| Raw Score (out of 100) | Percentile | Total Time Over 5 Weeks (Minutes) | Average Daily Time (Minutes) | Raw Score (out of 100) | Percentile |
| 36 | 50 | 100 | 4 | 37 | 39 |
| 36 | 50 | 573 | 23 | 43 | 50 |
| 36 | 50 | 1300 | 52 | 52 | 66 |
| 16 | 17 | 100 | 4 | 20 | 15 |
| 16 | 17 | 573 | 23 | 25 | 21 |
| 16 | 17 | 1300 | 52 | 35 | 36 |

**Notes:**

1. An average of 25 school days occurred between the October and December testing.
2. The B reading scores are estimated via linear regression.
3. The values of all variables in this table are within the ranges actually obtained in the BTES sample.
4. The average engaged time with high success rate in grade 2 reading for the October-December period was 573 minutes.

Table 2 also indicates that if this average student (in terms of October's test score) experienced only 4 minutes per day of engaged success time (100 minutes total for the intertest period), then s/he would be expected to show almost no change in raw score (36 out of 100 correct in October, 37 out of 100 in December) and would decline considerably in relative terms (50th percentile in October, 39th percentile in December). However, if the same student experienced very large amounts of engaged success time, 52 minutes per day in this example, then s/he could be expected to answer almost 50 percent more items correctly on the December tests than the October test (36 out of 100 correct in October, 52 out of 100 correct in December). Furthermore, in this situation the student would show considerable improvement in reading achievement relative to the other students in the study (50th percentile in October, 66th percentile in December). Additionally, the student who has lower achievement in October benefits as much or more from engaged success time than does the average student (see bottom three rows of Table 2). Finally, it should be noted that the range of 4 to 52 minutes per day in these examples is realistic, in that these values actually occurred in classes in this study.

Other research. Considerable other research corroborates these findings on the importance of student high success during instruction in terms of learning outcomes. Two major theories of classroom learning with extensive practical application, mastery learning (Block, 1971; Bloom, 1976) and programmed learning (Skinner, 1954, 1968) emphasize the importance of attaining a high level of student success on one objective in a series before moving on to the next. Student success during instruction is a basic criterion of the ongoing effectiveness of that instruction under either mastery learning or programmed learning procedures.

Field studies including a wide range of common classroom settings have also supported the importance of high student success during instruction. Cooper (1952) reported that the highest level of task difficulty where the student produced no errors appeared to be the most appropriate for reading instruction at grades 2 through 6. Crawford, King, Brophy & Evertson (1975) found that more effective teachers at grades 2 and 3 ask questions that students can answer correctly at least 75 percent of the time during oral recitation settings. This body of research provides ample evidence of the practical importance of student high success during reading instruction in the elementary grades.

Greater importance at lower reading skill levels. The Beginning Teacher Evaluation Study data (Fisher et al., 1978b) indicate that high success during instruction is especially crucial to the learning rate of lower achieving students. Table 3 presents data indicating how high success instruction influences the learning rates of students at high, medium, or low initial achievement levels. The cell entries in Table 3 for residual achievement may be loosely thought of as measures of learning rates. Each row represents an initial achievement level (top rows are high initial achievement, bottom rows are low). Each column represents a success rate during instruction over a seven month period from October to May (low success is on the left and high success is on the right). Note at both grades 2 and 5 that the difference in learning rate (cell entries) due to changes in success during instruction (compare the left and right entries in each row) is greater for students with low initial achievement (the bottom row for each grade level).

Table 3

Conjoint Relationship of Pre-Achievement in Reading (October Testing) High Success (October to May) in Terms of Residual Achievement in Reading (May Test Score Residualized on October Test Score)

Grade 2 (N = 139)

| Pre-Achievement (October) | Low | Medium | High |
|---|---|---|---|
| High | -13 (n=3) | 4 (n=22) | 0 (n=22) |
| Medium | -6 (n=13) | -3 (n=19) | 5 (n=12) |
| Low | -10 (n=23) | 3 (n=19) | 37 (n=6) |

High Success Rate[a]

Grade 5 (N = 122)

| Pre-Achievement (October) | Low | Medium | High |
|---|---|---|---|
| High | 2 (n=7) | -3 (n=17) | -1 (n=16) |
| Medium | 3 (n=13) | 3 (n=24) | 11 (n=4) |
| Low | -5 (n=15) | -2 (n=20) | 3 (n=6) |

High Success Rate[a]

Cell entries are mean residual achievement for the October to May period and the number of students in the cell ("n" in parentheses).

The standard deviation of residual achievement was 21.8 at grade 2 and 15.8 at grade 5.

[a]Less than 40 percent high success rate was categorized as a low percentage (left column), while greater than or equal to 60 percent high success rate was categorized as a high percentage (right column).

Furthermore, note in Table 3 that the influence of success on learning is greater at grade 2 than at grade 5. In fact, high achievers at grade 5 do not appear to benefit from increases in success during reading instruction. Apparently the need for high success during instruction is related to developmental characteristics of the learner. One might hypothesize, on the basis of these data, that as the learner grows in maturity and intellectual skills it becomes possible for him/her to benefit from more challenging instructional tasks. However, the learner who is operating at a more rudimentary academic level appears to require very high levels of success during instruction, probably involving less direct challenge and more practice and review. Hence, high success appears to be most important in the basic skill domains of early elementary grade instruction.

It should be noted that this interaction between high success and student pre-achievement levels, in terms of residual post-achievement, tends to contradict the hypothesis that the effects of high success reflect student aptitude that is unmeasured by the pre-achievement test. Such an aptitude effect would not diminish at higher pre-achievement levels, nor would it disappear among high-achieving fifth-grade students. Hence, high success during instruction appears to be a treatment, the effects of which diminish as the student exceeds a fifth-grade level of reading proficiency. The high success treatment is most powerful at the beginning level of reading skills (grades 1 and 2).

Process Underlying the Relation of High Success with Learning

Two areas of explanation for the relation of high success instruction with learning will be discussed briefly here: cognitive processes and affective processes.

Cognitive processes. The interaction described above, where high success during reading instruction is especially effective at the early elementary levels but appears to have no effect beyond the fifth-grade level of achievement, might be explained in terms of theories of cognitive development that posit important changes in cognitive processing over the elementary grade years (Bruner, 1964; Bruner, Goodnow & Austin, 1956; Inhelder & Piaget, 1952). These theories describe the development of symbolic, abstract, verbal and logical cognitive skills and abilities at age levels generally consistent with the achievement level at which high success instruction was observed to no longer be effective in the data presented above (i.e., beyond grade 5). This might suggest that the younger students need instructional tasks allowing them a high level of success because they lack the problem-solving skills necessary to deal with the abstract and symbolic requirements of more challenging reading tasks. That is, the younger student may be unable to learn efficiently when presented with tasks that s/he can not perform accurately during initial trials. At a later stage of development, with greater symbolic and logical skills, the student may be able to learn from prior errors, using the information of an inaccurate response to deduce what the desired response must be. The younger student, however, may learn most efficiently by a more gradual, perhaps inductive, process, where the accumulation of accurate responses on one set of tasks is required before the student understands that set of tasks well enough to move on to the next set.

This interpretation may be more valid for the more abstract and conceptual reading skills, such as decoding strategies and comprehension, than it is for skills that a child might learn through rote memory, as is possible with word recognition and spelling.

The reduced value of high success during rote learning is indicated by Atkinson and Lorton (1969) in a study of computer-based rote spelling instruction

among fourth through sixth grade students. It was found that the students learned spelling words more rapidly when they spent more time reviewing the words with which they had the most difficulty (least success). That is, they progressed more rapidly by reviewing what they did not already know. Note that the spelling words were selected from a pool of words appropriate for fourth through sixth grade students, so that the frustration of an unreasonable task was avoided. Note also that the study was conducted with students at the transitional level of achievement, where high success during instruction is becoming less important (perhaps even unimportant among the sixth graders). Still, it is pertinent to compare this study, where high success reduced the rate of rote learning of spelling words, with the previously discussed data where high success was beneficial to overall rates of learning in reading, even at the fifth grade.

However, rote learning may be effective at lower success levels only during the initial stages of instruction even for the less abstract and conceptual reading skills. If, as has been proposed by LaBerge and Samuels (1974) and Perfetti and Hogaboam (1975), automaticity in word recognition and in decoding skills is essential to the later development of comprehension skills, then it would never be sufficient to instruct only at the lower success levels for rote learning. High success instruction would be required after the student had learned to respond accurately for a sufficient period of time to allow for the development of automaticity. Note also that high success might be especially important for remedial reading instrucion, if automaticity is a key element missing among students requiring remedial work.

Affective processes. Regardless of the effects of high success instruction on cognitive processing, the relationship of high success and affective student response may account for the enhanced learning rates of early elementary reading students experiencing high success during instruction. There is evidence that

elementary students enjoy instruction more when they are experiencing high success and that they exhibit higher levels of attention and generally more appropriate classroom behavior. This would result in increases in attention levels during instruction, which would result in increased learning rates, particularly over longer periods of time.

Schotanus (1967) found that second grade students, when allowed to choose, prefer to read material that is easy relative to their own reading abilities. Furthermore, this relationship was more pronounced among students with less positive attitudes toward reading, even though the students with less positive attitudes read as well as students with more positive attitudes. This preference accounts for the increased attention generally exhibited by elementary students when reading instruction is oriented toward high success. The Beginning Teacher Evaluation Study (Fisher et al., 1978a) found high success during reading instruction to be positively associated with attention levels at both grades 2 and 5, while low success was negatively associated with attention at both grades. Miller and Hess (1972) reported that fourth grade students exhibited higher attention during computer-assisted instruction on tasks where they made 20 percent or fewer errors. Jorgenson, Klein and Kumar (1977) found that third through sixth grade students showed generally more appropriate classroom behavior and motivation, in terms of a teacher-completed rating inventory, when reading instruction involved easier materials relative to the student's tested reading achievement level.

Related studies involving college students suggest that the preference for relatively more easy instructional tasks is related to anxiety evoked by the more difficult materials. O'Neil, Spielberger and Hansen (1969), using computer-based mathematics tasks with college students, found that the more difficult tasks resulted in increased anxiety levels for all subjects. In

addition, it was found that subjects with generally greater levels of anxiety made more errors on difficult tasks and fewer errors on easy tasks than did less anxious students. Crawford (1978), using programmed instruction in physiological psychology with college students, found that subjects with high achievement needs and low fear of failure performed better with more difficult instruction (40 percent errors rather than 7 percent), whereas subjects with low achievement needs and high fear of failure learned more with less difficult tasks.

The role of high success during instruction in producing more positive attitudes and higher levels of attention may be especially crucial to students in remedial reading programs. These students may develop negative attitudes toward reading as a result of the unfavorable comparative situation in which they find themselves. Further, their lack of previous progress could be related to low levels of attention in some cases. In addition, their previous lack of success during reading instruction may cause reading instruction to be an anxiety-provoking event during which they experience fear of failure.

The Control of Student Success During Instruction

There are two basic approaches to the control of student success during instruction: 1) the instructional procedure used to attain a given curriculum objective can be modified to increase or decrease the difficulty of the task or 2) the instructional objectives can be identified within a curriculum sequence at greater or lesser levels of difficulty. Either approach is readily within the practical repertoire of most classroom teachers.

Samuels (1979) offers one example of a simple, practical and effective change in instructional procedure that raises both success during instruction and the rate of learning for remedial reading students. This procedure is called "The Method of Repeated Reading." The central feature of this procedure

is that a short, meaningful passage is read repeatedly until a satisfactory level of fluency is attained. Fluency is described in terms of accuracy and speed, with speed getting the greater emphasis during instruction. The underlying theory is that readers must attain automaticity before they can fully comprehend a passage, and they must comprehend before they can enjoy reading. (See the previous discussion of the role of automaticity in reading.) Hence, repeated reading is used to attain speed, which leads to considerably greater comprehension, motivation and pleasure. The technique has been used primarily for remedial instruction among children and adults of both normal and deficient abilities.

Samuels describes three stages that the student passes through during the repeated readings: 1) the initial stage of inaccurate reading where the student is learning to correctly identify the words in the passage, 2) the accuracy stage where the student can read the passage accurately, but only in a halting and expressionless way, and 3) the automatic stage where the student is able to read accurately, fluently and without attention to decoding. It is this inattention to decoding that enables the reader to focus attention on expression, comprehension and, ultimately, just the pleasure of reading.

Note that the repeated reading approach starts with an inaccurate stage where the student may commit a large proportion of errors. This is certainly not high success. It is, however, consistent with the findings of Atkinson and Lorton (1969), discussed previously, where rote learning for recall can be accomplished efficiently by focusing on those items that the student does not yet know. However, the next two stages, accuracy and automaticity, both have few or no student errors, so that the student experiences high success for the majority of the repeated reading instructional sequence.

It is important to underscore that the repeated reading approach does not require changes in the difficulty level of the reading text as a means of controlling success. The student can read any passage, within reasonable limits, achieving high success through the simple expedient of repetition. However, the procedure does require that automaticity always be included as an eventual instructional objective.

The control of student success during instruction by identifying curriculum objectives appropriate for student succcess is represented by both the mastery learning (Block, 1971; Bloom, 1976) and programmed learning (Skinner, 1954, 1968) models of instruction. Each of these approaches depends heavily upon locating the student at a level within an organized sequence of objectives at which the student can readily attain a high level of success. As with the repeated reading strategy, the student may not initially experience high success during mastery or programmed instruction. However, high levels of student success will be attained rapidly and on a regular basis, because the student is placed at an appropriate objective level and is never allowed to proceed prematurely to an objective for which s/he is unprepared.

Need for a Procedure to Analyze Task Appropriateness

It is the proposition of this paper that student high success during daily classroom instructional tasks provides a crude but practical measure of task appropriateness. The preceding discussion has reviewed considerable evidence that high success during instruction contributes to the acquisition of basic reading skills. Further, examples of procedures with which classroom teachers can and do routinely control student success during instruction have been considered.

The evidence also suggests that changes in instruction to increase student success levels are probably most crucial for remedial efforts. The previously discussed data on the association of success with reading achievement showed a stronger relationship for the lower achieving students and at the more basic levels of reading instruction. Furthermore, students who need remedial reading instruction are the most likely members of a typical classroom to experience inadequate success during ongoing instruction, because these students represent the lower extreme of the classroom distribution. If instruction tends to center more on the average skill level in the class, then the slower students will suffer the most. The students above the average may even benefit, in that they will experience the greatest success during instruction.

The case for analyzing student success during ongoing classroom instruction is substantiated further by the general tendency for classroom reading instruction to be excessively difficult for the average student. The Beginning Teacher Evaluation Study (Fisher et al., 1978a) found that second and fifth grade reading instruction has an average proportion of fifty percent high success (in terms of instructional time), but that more than fifty percent is optimal for student learning. This indicates that reading instruction is typically carried out in such a way that most elementary students receive inadequate success during instruction. Related findings suggest that reading curriculum materials may be designed at inappropriately high difficulty levels relative to student needs. Fitzgerald (1979) reported that reading skills required for grade 3 through 6 reading workbooks are usually higher than those for which the associated basal text is designed, frequently by as much as three grade levels. Bradley and Ames (1977) find that even within many basal reading texts the variability of difficulty among different selections can span several grade levels.

Indeed, it is possible that the commonly recognized trend where the gap between lower and higher achievers widens over succeeding school years may actually be due to an inadequate provision for high success in the design of commonly used curriculum materials.

## A Simple Procedure for the Analysis of Task Appropriateness

The evidence above substantiates the need for a practical procedure that can be used by teachers in ongoing classrooms for the analysis of student success during instruction as an indicator of task appropriateness. This is not to say that high success is the only indicator or that is is the most important. Rather, it is one important indicator related to reading achievement that appears to currently receive inadequate or misdirected consideration. Further, high success appears to be especially promising for use in remedial reading instruction.

The procedure described below is presented here as one example of how high success can be readily analyzed by teachers in ongoing classrooms. It is not meant to be definitive or fully refined. This procedure has been used on a pilot basis in seven classrooms where it was found to be both practical and useful. The procedure is based on the coding procedures developed for the Beginning Teacher Evaluation Study. A complete account of the current version is reported by Marliave, Fisher and Dishaw (1979). The pilot testing is reported by Fisher, Marliave and Dishaw (in press). A brief description of these success coding procedures, as they have been presented to teachers, follows.

> Success level coding is based on the individual student's error rate on a given task. This might also be described as the difficulty of the specified task for a particular student.
>
> Three categories of success level are coded: high, medium, and low. High success is coded when the student is able to complete the entire task correctly (i.e., with no errors or only careless errors).

Therefore, high success usually represents a situation where the student is reviewing, practicing, or "firming up" a previously learned skill.

As a general guideline, "careless errors" can be defined as follows: 1) fewer than ten percent errors on open-ended questions is "careless," 2) fewer than five percent errors on dichotomous-choice questions (such as true-false) is "careless," and 3) fewer than five to nine percent errors on multiple-choice questions (exact percent depends on the number of choices per question) is "careless."

Low success is coded when the student is unable to complete any of the task correctly, except by guessing. That is, the student does not understand the task at all. He/she may respond correctly at a chance level (that is, by guessing). This is likely to occur with true/false or multiple-choice questions. For example, one would expect a student to be able to guess correctly on 50 percent of true/false items or 25 percent of multiple-choice items with four choices. These chance levels of correct responses would be coded as low success, because the student has shown no understanding of the academic substance of the task.

Medium success is coded for anything between high and low success. Therefore, medium success indicates that the student is able to perform some of the task correctly, but not all of it.

The teacher should generally code success level him/herself. The teacher's familiarity with the students and their assignments will facilitate the coding process, and the coding process will enhance the teacher's knowledge of the students and their work.

The teacher can usually code success level on the basis of corrected written assignments (although it is possible to code oral activities, such as oral reading). A written assignment might consist of a page in a workbook, a ditto page, etc. Therefore, coding success levels will often consist of transforming a score on a previously corrected assignment to one of the three categories described above.

It is generally convenient to code an accumulated sequence of corrected written assignments for a group of students all at one time. For example, a small group of students could be coded for their success on twenty pages that they have completed in their workbook over the previous two or three weeks. These results could then be recorded in a matrix with a row for each student and a column for each workbook page (or task within a page). When such a record is complete, it is possible to scan rows to look for students who are experiencing too much medium or low success and to scan columns to look for workbook pages that are too difficult for the group as a whole. Subsequent instruction can be designed to take this information into account.

A complete set of training materials for success coding would include evaluation and analysis strategies for using the data to be collected.

Currently, this exists only in the most rudimentary form. Teachers have been instructed to look for cases where more than half of a student's tasks are coded at medium and low success levels. This is described as an indication that instructional changes are needed to raise the student's level of success during instruction. In addition, more than ten percent of a student's tasks in the low success category is considered an indication of problems, even when high success appears to be occurring at reasonable rates.

## Summary

Evidence has been reviewed showing that high student success during ongoing reading instruction is related to enhanced reading achievement at the early elementary level. Further, this is particularly true for low achievers and students requiring remedial instruction in basic reading skills. Cognitive and affective interpretations of this relationship have been considered. In particular, the importance of high success for the development of reading automaticity and consequent reading comprehension has been discussed. Alternative approaches to the control of student success during instruction have also been reviewed, including both changes in instructional procedure and changes in curriculum objectives. Finally, the inadequacy of current curriculum practices for student instructional success was discussed. A procedure for analyzing student success during instruction was presented as an example of how teachers can determine where their instruction fails to allow for adequate student success. This would be the first step to correcting inadequate success during reading instruction. This and similar procedures may have valuable applications in remedial reading instruction.

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